# StorageTek Automated Cartridge System Library Software

**Product Information** 

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StorageTek Automated Cartridge System Library Software Product Information Guide Part Number: 316137601

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# **Summary of Changes**

#### EC released document table.

EC	Date	Edition	Revision	Description
EC001630	May 2010	First	AA	ACSLS 7.3.1:
				<ul> <li>Supports Redundant Electronics.</li> <li>Software no longer enforces the right-to- use license nor checks for a valid license key.</li> </ul>

## Updates

Date	Revision	Description
October 2010	BA	<ul><li>Support for HP-LTO5</li><li>Support for IBM-LTO5</li></ul>

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# **Preface**

### About this Book

Automated Cartridge System Library Software (ACSLS) is Oracle's StorageTek UNIX server software that controls a StorageTek Automated Cartridge System (ACS). The StorageTek ACS family of products consists of fully automated, tape cartridge-based data storage and retrieval systems. ACSLS supports network access to different client systems that can range from workstations to mainframes to supercomputers running on a variety of operating systems.

#### **Audience**

This guide is for system programmers and system administrators who need general requirements, enhancements for ACSLS 7.3.1, and other information.

#### **About the Software**

This guide supports ACSLS 7.3.1.

## **Conventions for Reader Usability**

Conventions are used to shorten and clarify explanations and examples within this book.

## **Typographic**

The following typographical conventions are used in this book:

- **Bold** is used to introduce new or unfamiliar terminology, or it's used in steps to indicate either an action or a decision the user has to make.
- Letter Gothic is used to indicate command names, filenames, and literal output by the computer.
- Letter Gothic Bold is used to indicate literal input to the computer.
- Letter Gothic Italic is used to indicate that you must substitute the actual value for a command parameter. In the following example, you would substitute your name for the "username" parameter.

Logon username

• A bar (|) is used to separate alternative parameter values. In the example shown below either username or system name must be entered.

Logon username | systemname

- Brackets [] are used to indicate that a command parameter is optional.
- Ellipses ( ... ) are used to indicate that a command may be repeated multiple times.
- This guide shows all ACSLS commands in lowercase. You can, however, enter these commands in all lowercase, all uppercase, or any combination of uppercase and lowercase. Single underlines show minimum command abbreviations. For example, aud and au are valid forms of the audit command.

### **Keys**

Single keystrokes are represented by double brackets [[ ]] surrounding the key name. For example, press [[ESC]] indicates that you should press only the escape key.

Combined keystrokes use double brackets and the plus sign (+). The double brackets surround the key name and the plus sign is used to add the second keystroke. For example, press [[ALT]]+C indicates that you should press the alternate key and the C key simultaneously.

#### **Enter Command**

The instruction to "press the <Enter> key" is omitted from most examples, definitions, and explanations in this book.

For example, if the instructions asked you to "enter" Logon pat, you would type in Logon pat and press <Enter>.

However, if the instructions asked you to "type" Logon pat, you would type in Logon pat and you would *not* press <Enter>.

## **Symbols**

The following symbols are used to highlight text in this book.

WARNING: Information necessary to keep you from damaging your

hardware or software.

CAUTION: Information necessary to keep you from corrupting your

data.

**Hint:** Information that can be used to shorten or simplify your task or they

may simply be used as a reminder.

**Note:** Information that may be of special interest to you. Notes are also used

to point out exceptions to rules or procedures.

#### **Related Documentation**

#### **ACSLS Documentation**

The ACSLS Documentation CD-ROM, is automatically shipped with the product package and is provided in PDF format. These documents are:

- StorageTek ACSLS 7.3.1 Product Information
- StorageTek ACSLS 7.3.1 Administrator's Guide
- StorageTek ACSLS 7.3.1 Messages
- StorageTek ACSLS 7.3.1 Installation Guide
- StorageTek ACSLS 7.3.1. Quick Reference

#### **ACSLS Information on the Website**

In addition to the PDF collections on the ACSLS Information CD-ROM, the website provides PDF collections for ACSLS. The URL is:

http://docs.sun.com

**Overview** 

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StorageTek Automated Cartridge System Library Software (ACSLS) is Oracle's StorageTek server software that controls a StorageTek tape library. An Automated Cartridge System (ACS) is a group of tape libraries connected through pass-thru-ports (PTPs). StorageTek ACSLS accesses and manages information stored in one or more ACSs through command processing across a network. The software includes a system administration component and interfaces to client system applications, and library management facilities.

With ACSLS 7.3.1, we specify a minimum memory requirement of 512MB and a swap requirement of 1GB (on disk).

Please check the website for any maintenance releases.

# Software Requirements

ACSLS 7.3.1 requires the following software levels:

- The minimum supported Solaris version is Solaris-10, Update-4 (08/07). A supported version of PostgreSQL is included as part of the standard Solaris installation and no special installation procedures are necessary for PostgreSQL. If you are running in Solaris Zones, be sure to apply the latest Solaris patch cluster.
- AIX 6.1 base or TL1. The PostgreSQL 8.1.4 database is supported, but is not bundled with AIX. It is included with the ACSLS 7.3.1 CD, and must be installed separately.
- ACSAPI Clients must support ACSAPI packet version 3 or higher.

## New Features and Enhancements

ACSLS 7.3.1 now supports the following new features and enhancements:

- Support for HP-LTO Generation 5
- Support for IBM-LTO Generation 5
- Redundant Electronics (RE).

ACSLS now connects to multiple SL8500 libraries with RE in a string and accurately tracks and reports the status of each connection. When RE is installed and licensed in a library, ACSLS identifies which Library

Controller card (LC) is active and only sends requests to the active LC on each library.

You **must** upgrade to ACSLS 7.3.1 before installing the RE library firmware (SL8500 6.00 firmware).

 ACSLS Tracks both the Desired State and the Current State of LSMs and Tape Drives

Current state is now tracked more accurately than before, reflecting whether a library component is ready and communicating, limited by the desired state of the component.

The desired state manages library and tape drive availability. Desired state is the availability that that you want for an ACS, port connection, LSM, and tape drive. You set the desired state via the vary command. The desired state for any of the library components can be viewed using the query lmu and display commands.

ACSLS now accurately tracks the current state of LSMs and drives. For example, if the desired state of an LSM is online but it is not ready, its current state is offline.

The desired state for ACSs and ports is already supported, and ACSLS has tracked the current state of ACSs and ports for years.

 Queue and Retry Mounts and Dismounts when the Library is Temporarily Unavailable

ACSLS now queues and retries mount and dismount requests for clients when temporary library outages are detected.

Temporary outages occur when the desired state of the library hardware is **online**, but the current state is **offline**. Examples of temporary outages are: when an LSM door is open; when ACSLS loses communications with a library; or during an LC switch operation. During a temporary library or tape drive outage, mounts and dismounts are queued, and are retried when the library is available.

If the desired state of the library hardware is **offline**, then ACSLS fails mount or dismount requests with the appropriate error status.

New dynamic variables control queuing and retrying mounts and dismounts:

- MOUNT\_RETRY\_DELAY controls how often queued mounts and dismounts are retried or availability of libraries and drives are rechecked.
- MOUNT\_RETRY\_TIME\_LIMIT is the time limit to queue and retry mounts and dismounts. After this, requests fail.
- No Longer Requires Software Licenses

Beginning with StorageTek ACSLS version 7.3.1 the right-to-use license is no longer enforced in StorageTek ACSLS, and ACSLS no longer checks for a valid license key. Messages regarding a soon-to-be-expired license key or library capacity license no longer appear on the system console or in the acsss\_event.log.

The following utilities no longer function in their capacity to set and check for a valid license key:

- licensekey.sh
- get\_license\_info.sh

To view your library slot usage use the free\_cells.sh utility.

Oracle Branding Changes

ACSLS 7.3.1 has been re-branded as an Oracle product.

New testports Utility

A new testports utility tests the connection to TCP/IP libraries and whether the ACS and port connection is online or offline.

# ■ Co-hosting on the ACSLS Server

We do not test, certify, or support co-hosting of other applications on ACSLS servers unless you are running in a Zone (container) environment. This applies to this release and prior releases. ACSLS must be the only application running in a Zone.

Management of StorageTek SCSI libraries within Solaris zones is supported by ACSLS when you install the STKchanger driver package in the global zone.

## LSMs Supported

- 4410 LSMs
- 9310 LSMs
- 9360 LSMs
- 9740 SCSI-Attached LSMs
- 9740 HLI-Attached LSMs
- 9710 LSMs
- 9714 LSMs
- 9730 LSMs
- 9738 LSMs

- L20, L40, L80 LSMs
- L180 LSMs
- L700 LSMs
- L700e PTP
- SL500 LSMs
- L5500 LSMs
- SL3000 LSM
- SL8500 LSMs
- StorageTek Virtual Tape Library (VTL)

# Tape Drives Supported

The last column in the Tape Drives table identifies when ACSLS support for that tape drive and it's associated media was added (only after ACSLS 7.0).

The following table is used to translate drive types between applications. The Drive Type Name represents the drive type in cmd\_proc and event log messages. The ACSAPI Drive Type Number is used in ACSLS software operations and ACS\_API client communications.

#### Notes:

The drive type for DLT and SDLT drives is incremented by 40 hexadecimal or 64 decimal when these drives are reported by Host/Library Interface libraries. The incremented or "offset" drive type is reported in parentheses.

The SL8500 supports LTO-5 drives starting with the 6.02 firmware. ACSLS must be at the 7.3.1 or 8.0.2+ update level to support the SL8500 6.02+ firmware.

**Table 1. Tape Drives Supported.** 

ACSAPI Drive Type Number	Drive Domain (hex and character, if applicable)	Drive Type Reported by Library (decimal)	Drive Type Name	Tape Drive Description	ACSLS Support if after 7.0
0	00h	64	4480	StorageTek 18-track	
1	00h	08	4490	StorageTek Silverton 36-track	
2	00h	32	9490	StorageTek TimberLine 36-track high performance	

ACSAPI Drive Type Number	Drive Domain (hex and character, if applicable)	Drive Type Reported by Library (decimal)	Drive Type Name	Tape Drive Description	ACSLS Support if after 7.0
3	00h	16	SD3	StorageTek Redwood Helical	
4	00h	04	4890	StorageTek Twin Peaks 36-track	
5	01h	01 (65)*	DLT2000	Quantum DLT2000	
6	01h	02 (66)*	DLT2000XT	Quantum DLT2000XT	
7	01h	03 (67)*	DLT4000	Quantum DLT4000	
8	01h	04 (68)*	DLT7000	Quantum DLT7000	
9	00h	02	9840	StorageTek T9840A	
10	00h	33	9491	StorageTek TimberLine EE 36- track	
11	01h	07 (71)*	DLT8000	Quantum DLT8000	
12	00h	03	9840-3590	T9840A with IBM 3590 emulation	
13	00h	05	T9940A	T9940A with SCSI/ Fibre or VSM3490	
14	00h	06	99403590	T9940A with 3590 emulation	
15	01h	20 (84)*	SDLT	Super DLT 220	
16	00h	01	T9840B	High Performance 9840 with SCSI/ Fibre or VSM3490	
17	00h	07	T9840B35	T9840B with 3590 emulation	
18	4Ch ("L")	48	HP-LTO	HP LTO Generation 1	
19	4Ch ("L")	49	IBM-LTO	IBM LTO Generation 1	
20	4Ch ("L")	50	CER-LTO	Certance LTO Generation 1	
21	00h	09	T9940B	T9940B with SCSI/ Fibre or VSM3490	

ACSAPI Drive Type Number	Drive Domain (hex and character, if applicable)	Drive Type Reported by Library (decimal)	Drive Type Name	Tape Drive Description	ACSLS Support if after 7.0
22	00h	10	T9940B35	T9940B with 3590 emulation	
23				reserved	
24	01h	21 (85)*	SDLT-320	Super DLT 320	
25	00h	11	T9840C	T9840C with Fibre or VSM3490	
26	00h	12	T9840C35	T9840C with 3590 emulation	
27	4Ch ("L")	51	HP-LTO-2	HP LTO Generation 2	
28	4Ch ("L")	52	IBM-LTO-2	IBM LTO Generation 2	
29	4Ch ("L")	53	CER-LTO-2	Certance LTO Generation 2	
30	01h	23 (87)*	SDLT-600	Super DLT 600	ACSLS 7.1
31	54h ("T")	13	T1A	T10000A with Fibre or VSM3490	ACSLS 7.1 with PUT0501
32	54h ("T")	14	T1A35	T10000A with IBM 3592 emulation	ACSLS 7.1 with PUT0501
33	4Ch ("L")	54	HP-LTO-3	HP LTO Generation 3	ACSLS 7.1 with PUT0501
34	4Ch ("L")	55	IBM-LTO-3	IBM LTO Generation 3	ACSLS 7.1 with PUT0501
35	4Ch ("L")	56	CER-LTO-3	Certance LTO Generation 3	ACSLS 7.1 with PUT0501
36				reserved	
37	54h ("T")	24	T1AE	T10000A, fibre or VSM3490, with encryption enabled	ACSLS 7.1 with PUT0602

ACSAPI Drive Type Number	Drive Domain (hex and character, if applicable)	Drive Type Reported by Library (decimal)	Drive Type Name	Tape Drive Description	ACSLS Support if after 7.0
38	54h ("T")	25	T1AE35	T10000A - IBM 3592 emulation with encryption enabled	ACSLS 7.1 with PUT0602
39				reserved	
40				reserved	
41	00h	18	T9840D	T9840D, fibre or VSM3490	ACSLS 7.1 with PUT0602
42	00h	19	T9840D35	T9840D - IBM 3592 emulation (MVS attach)	ACSLS 7.1 with PUT0602
43	00h	20	T9840DE	T9840D, fibre or VSM3490, with encryption enabled	ACSLS 7.1 with PUT0602
44	00h	21	T9840DE5	T9840D- IBM 3592 emulation (MVS attach) with encryption enabled	ACSLS 7.1 with PUT0602
45	01h	24 (88)*	DLT-S4	Quantum DLT-S4	ACSLS 7.1 with PUT0602
46	4Ch ("L")	57	HP-LTO4	HP LTO Generation 4	ACSLS 7.1 with PUT0701
47	4Ch ("L")	58	IBM-LTO4	IBM LTO Generation 4	ACSLS 7.1 with PUT0701
48				reserved	
49	54h ("T")	26	T1B	T10000B with Fibre or VSM3490	ACSLS 7.1 with PUT0701 & PTF or ACSLS 7.2 with PUT0702

ACSAPI Drive Type Number	Drive Domain (hex and character, if applicable)	Drive Type Reported by Library (decimal)	Drive Type Name	Tape Drive Description	ACSLS Support if after 7.0
50	54h ("T")	27	T1B35	T10000B with IBM 3592 emulation	ACSLS 7.1 with PUT0701 & PTF or ACSLS 7.2 with PUT0702
51	54h ("T")	28	T1BE	T10000B with Fibre or VSM3490 and encryption	ACSLS 7.1 with PUT0701 & PTF or ACSLS 7.2 with PUT0702
52	54h ("T")	29	T1BE35	T10000B with encryption and IBM 3592 emulation	ACSLS 7.1 with PUT0701 & PTF or ACSLS 7.2 with PUT0702
53				reserved	
54				reserved	
55				reserved	
56				reserved	
57	4Ch ("L)	59	HP-LTO5	HP-LTO Generation 5	ACSLS 7.3.1
58	4Ch ("L)	60	IBM-LTO5	IBM-LTO Generation 5	ACSLS 7.3.1

# **■** Tape Media Supported

The following table lists the compatible tape media supported for each transport type.

Note:

- \* Legacy StorageTek media do not have a media domain on the label.
   They are reported as media domain 0 (zero).
- \*\* 3480 cartridges do not have a media type label. They are reported as media type1.
- \*\*\* DLT cartridges do not have a media domain on the label. They are reported as media domain 1. SDLT cartridges with 7 character barcodes are also reported as media domain 1.
- \*\*\*\* When a media type is reported as cleaning cartridge "maybe", both data or cleaning cartridges can have this media type.

Table 2. Tape Media Supported

ACSAPI Media Type Number	Media Type Name	Media Description	Media Domain (on label)	Media Type (on label)	Cleaning Cartridge
0	3480	3480 18 or 6-track	0*	1**	maybe
1	3490E	3490E 36-track	0*	Е	no
2	DD3A	StorageTek Redwood (Helical) 10GB	0*	А	no
3	DD3B	StorageTek Redwood (Helical) 25GB	0*	В	no
4	DD3C	StorageTek Redwood (Helical) 40GB	0*	С	no
5	DD3D	StorageTek Redwood Cleaning Cartridge	0*	D	yes
6	DLTIII	Quantum DLT III -10GB	1***	С	maybe
7	DLTIV	Quantum DLT IV - 20GB or 35GB	1***	D	no
8	DLTIIIXT	Quantum DLT IIIxt - 15GB	1***	Е	no
9	STK1R	T9840A, T9840B, T9840C or T9840D data cartridge	0*	R	no
10	STK1U	T9840A, T9840B, 9840C cleaning cartridge	0*	U	yes
11	EECART	9490EE 36-track	0*	Z	no
12		reserved			
13	STK2P	9940 data cartridge	0*	Р	no
14	STK2W	9940 cleaning cartridge	0*	W	yes

ACSAPI Media Type Number	Media Type Name	Media Description	Media Domain (on label)	Media Type (on label)	Cleaning Cartridge
15		reserved			
16	LTO-100G	LTO Generation 1 data cartridge	L	1	no
17	LTO-50GB	LTO Generation 1 data cartridge	L	А	no
18	LTO-35GB	LTO Generation 1 data cartridge	L	В	no
19	LTO-10GB	LTO Generation 1 data cartridge	L	С	no
20	LTO-CLN2	IBM cleaning cartridge	С	2	yes
21	LTO-CLN3	Certance cleaning cartridge	С	3	yes
22	LTO-CLN1	HP cleaning cartridge	С	1	yes
23	SDLT	Super DLT Generation I cartridge	1***	S	maybe
24		reserved			
25	LTO-CLNU	LTO universal cleaning cartridge	С	U	yes
26	LTO-200G	LTO Generation 2 data cartridge	L	2	no
27	SDLT-2	Super DLT Generation II data cartridge	1***	2	no
28	T10000T1	T10000 Version 1 data cartridge	Т	1	no
29	T10000TS	T10000 Version 1 "sport" data cartridge	Т	S	no
30	T10000CT	T10000 Version 1 cleaning cartridge	С	Т	yes
31	LTO-400G	LTO Generation 3 data cartridge	L	3	no
32	LTO-400W	LTO Generation 3 WORM data cartridge	L	Т	no
33		reserved			
34	SDLT-S1	Super DLT Generation I data cartridge in SDLT-220 format	S	1	maybe

ACSAPI Media Type Number	Media Type Name	Media Description	Media Domain (on label)	Media Type (on label)	Cleaning Cartridge
35	SDLT-S2	Super DLT Generation I data cartridge in SDLT-320 format	S	2	no
36	SDLT-S3	Super DLT Generation II data cartridge	S	3	no
37	SDLT-S4	Super DLT Generation 4 data cartridge	S	4	no
38	SDLT-4	Super DLT Generation 4 data cartridge	1***	4	no
39	STK1Y	T9840D cleaning cartridge	0*	Υ	yes
40	LTO-800G	LTO Generation 4 data cartridge	L	4	no
41	LTO-800W	LTO Generation 4 WORM data cartridge	L	U	no
42		reserved			
43		reserved			
44		reserved			
45	LTO-1.5T	LTO Generation 5 data cartridge	L	5	no
46	LTO-1.5W	LTO Generation 5 WORM data cartridge	L	V	no
47		reserved			

# ■ Tape Drive and Media Compatibility Supported

The following table lists the compatible media for each drive type. Use these values as input to the <u>me</u>dia <u>media\_type</u> and <u>dr</u>ive <u>drive\_type</u> parameters on ACSLS commands.

Table 3. Drive and Media Compatibility

Drive Type	Compatible Media (media_type)			
(drive_type)	Data Cartridge	Cleaning Cartridge		
4480	3480,	3480		
4490	3480, 3490E	3480		
4890	3480, 3490E	3480		
9490	3480, 3490E	3480		

<b>Drive Type</b> (drive_type)	Compatible Media (media_type)	
	Data Cartridge	Cleaning Cartridge
9490EE	3480 (read only), 3490E, EECART	3480
SD3	DD3A, DD3B, DD3C	DD3D
9840	STK1R	STK1U
9840-3590	STK1R	STK1U
T9840B	STK1R	STK1U
T9840B35	STK1R	STK1U
T9840C	STK1R	STK1U
T9840C35	STK1R	STK1U
T9840D	STK1R	STK1Y
T9840D35	STK1R	STK1Y
T9840DE	STK1R	STK1Y
T9840DE5	STK1R	STK1Y
T9940A	STK2P	STK2W
9940A-3590	STK2P	STK2W
T9940B	STK2P	STK2W
T9940B35	STK2P	STK2W
DLT2000	DLTIII	DLTIII
DLT2000XT	DLTIII, DLTIIIXT	DLTIII
DLT4000	DLTIII, DLTIIIXT, DLTIV	DLTIII
DLT7000	DLTIII, DLTIIIXT, DLTIV	DLTIII
DLT8000	DLTIII, DLTIIIXT, DLTIV	DLTIII
SDLT	SDLT, SDLT-S1, DLTIV	SDLT, SDLT-S1
SDLT-320	SDLT, SDLT-S1, SDLT- S2, DLTIV	SDLT, SDLT-S1
SDLT-600	SDLT, SDLT-2, SDLT- S1, SDLT-S2, SDLT-S3	SDLT, SDLT-S1
DLT-S4	SDLT-2, SDLT-4, SDLT-S2, SDLT-S3, SDLT-S4	SDLT,
HP-LTO	LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN1, LTO-CLNU

Drive Type	Compatible Media (media_type)		
(drive_type)	Data Cartridge	Cleaning Cartridge	
IBM-LTO	LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN2, LTO-CLNU	
CER-LTO	LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN3, LTO-CLNU	
HP-LTO-2	LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN1, LTO-CLNU	
IBM-LTO-2	LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN2, LTO-CLNU	
CER-LTO-2	LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN3, LTO-CLNU	
HP-LTO-3	LTO-400G, LTO-400W, LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN1, LTO-CLNU	
IBM-LTO-3	LTO-400G, LTO-400W, LTO-200G, LTO-100G, LTO-50GB, LTO-35GB, LTO-10GB	LTO-CLN2, LTO-CLNU	
CER-LTO-3	LTO-400G, LTO-400W, LTO-200G, LTO-100G, LTO-50G, LTO-35GB, LTO-10G	LTO-CLN3, LTO-CLNU	
HP-LTO4	LTO-800G, LTO-800W, LTO-400G, LTO-400W, LTO-200G	LTO-CLNU	
IBM-LTO4	LTO-800G, LTO-800W, LTO-400G, LTO-400W, LTO-200G	LTO-CLNU	
HP-LTO5	LTO-1.5T, LTO-1.5W, LTO-800G, LTO-800W, LTO-400G, LTO-400W	LTO-CLNU	
IBM-LTO5	LTO-1.5T, LTO-1.5W, LTO-800G, LTO-800W, LTO-400G, LTO-400W	LTO-CLNU	
T1A	T10000T1, T10000TS	T10000CT	
T1A35	T10000T1, T10000TS	T10000CT	

Drive Type (drive_type)	Compatible Media (media_type)	
	Data Cartridge	Cleaning Cartridge
T1AE	T10000T1, T10000TS	T10000CT
T1AE35	T10000T1, T10000TS	T10000CT
T1B	T10000T1, T10000TS	T10000CT
T1B35	T10000T1, T10000TS	T10000CT
T1BE	T10000T1, T10000TS	T10000CT
T1BE35	T10000T1, T10000TS	T10000CT

**Note:** For information about transport media, go to: http://www.storagetek.com/products/tape\_storage.html